Amendments to the Specification:

Provisional Application of

Christopher E. Smith and Samuel K. Giles

For

Vehicle Security System

Related Application
Priority as claimed under 35 USC 119/e for
Provisional Patent Application 60/470566, filed May 14, 2003

Summary of Invention

The present invention relates to interacting with a security system through a watch interface. The watch will be comprised of a display screen(s) that will show digital read-outs of the security system's status. The invention comprises relaying regular watch functions (time, date, etc.) also on a display screen(s).

Background – Field of Invention

This invention relates to security systems for vehicles and will later expand to homes. A user of the remote watch will not only be able to keep track of the time but also will be able to arm/lock, disarm/unlock and remotely start their vehicle by pushing specific buttons on the watch. It is common for people to lose or misplace their keys along with the keyless remote that is attached to the keys. Since the watch is placed on the users wrist, the user never has to worry about damage due to dropping it on a hard surface, in liquids (ex. water), or even losing their keyless remote as you would by having a keyless remote attached to keys or a key chain.

Background – Prior art (Discussion and Criticism of the relevant prior art)

Some of the latest inventions in the field of car security have been the 2-way transceivers.

They comprise of:

i. A display screen
ii. 4 buttons
iii. A small antennae

The 2-way transceiver remote confirms that your vehicle has received signals and alerts the user to system triggers and theft attempts. This remote can display 20 different icons including transmit, receive, remote start, arm/disarm, hood, trunk, door ajar, and extra sensors. The Auto Security Compustar is a semi-small remote start keyless entry that displays a car on the screen and shows the part of the car that is being tampered with.

These particular devices look like toys. They both still hold true to the traditional keyless entry remotes that can be attached to a key chain and possibly damaged by those people who toss their keys around and lost by those who are careless. It is also not waterproof as our invention can be and will not have the style along with convenience, as our invention will.

Objectives and Advantages (positive aspects of invention)

- The advantages of this invention are:

i. Digital or analog or a combination of digital/analog
ii. Linking the individual to his/her vehicle at all times
iii. Vibrates/beeping sound to alarm an individual whenever the vehicle is being tampered with and when the alarm is triggered.
iv. The watch gives you feedback by transmitting the condition of the vehicle.
v. This invention is located in the most convenient and easy to access area, the user's wrist. Having the device on the wrist will allow hassle-free convenient usage. Other car security devices have to be pulled out of a pocket, bag, or another area.
vi. The watch displays the time.
vii. Keeps track of time and a vehicle at all times.
viii. If you loose your keys you will also loose your keyless entry alarm remote. Since the security system is located on the watch, a person does not have to worry about losing the keyless remote.

ix. If you loose your keys then a person can feel safe about leaving a spare key in the car because they will still be able to unlock and disarm the security system from the remote watch which is worn on your wrist and not attached to the keys which can be lost.

Drawings & Figures

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Figure 5 Small AC Equivalent Output Circuit

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Figure 7 Side view of the watch, which is a basic means for controlling the security system.

Figure 8 Frontal/top view of the means for controlling the security system.

Figure 9 Frontal and side view of a prototype means for controlling the security system.

Figure 10 Frontal view of the means for controlling the security system.

Reference Numerals

Figure 1: Block Diagram of Digital Watch Remote Security System

100-Controller Processing Unit
102-Remote Watch
101-Antenna
104-Memory Unit
105-Timer
106-Trigger and Sensor Circuitry
107-Proximity Detector
108-Transceiver
109-Input Interface
110-Output Interface
111-Ignition Switch
112-Trunk Switch
113-Hood Switch
114-Door Switch
115-Valet Switch
116-Window Control
117-Panic Output
118-Starter Kill
119-Disarm Output
120-Armed Output
121-Automatic Starter
122-Character Display
123-Dome Light
124-Valet/Dashboard LED
125-Park Lights
126-Siren
103-Operational Signal

Reference Numerals

Figure 2: Block Diagram of the Digital Watch Remote

200-Watch Remote Console
201-Keypad
202-Liquid Crystal Display
203-Memory
204-Date(Month/Day)
205-Time(Hour/Minute)
206- Buzzer
207-Control Section
208-Timer
209-Mode Controller
210-Code Generator
211-Transmission Section
212-Code Data

Reference Numerals

Figure 3: Basic Outline of Switching Device

300- Watch & Remote Control Transmitter

301- Switching Circuitry

302- Switch select lines

304- Select Switching Lines

Reference Numerals

Figure 4: EnMOSFET Switch

400-Switched Circuit

401-Low voltage terminal of the switch

402-High voltage terminal of the switch

403-n-channel enhancement MOSFET

403a-Source of enhancement MOSFET switch

403b-Gate of enhancement MOSFET switch

403c-Drain of enhancement MOSFET switch

404-2kΩ Resister

405-Power Source

Reference Numerals

Figure 5: Small AC Equivalent Output Circuit

500a-What the AC output circuit is connected to

500b- What the AC output circuit is connected to

501a-High voltage terminal of switch (on)

501b- High voltage terminal of switch (off)

502a-Low voltage terminal of switch (on)

502b- Low voltage terminal of switch (off)

503a-RDS on – On position resister

504a-2kΩ Resister

504b-2kΩ Resister

505a- Drain of enhancement MOSFET switch (on)

505b- Drain of enhancement MOSFET switch (off)

506a-Source of enhancement MOSFET switch (on)

506b- Source of enhancement MOSFET switch (off)

503b-RDS off – Off position resister

Reference Numerals

Figure 6: EACS Controlled Switch System

600-3V Battery voltage

601-Remote transmitter circuit

602-Watch Circuit

603a-High voltage lines for the watch circuit

603b-Low voltage lines for the watch circuit

604a-High voltage lines for the Remoter Transmitter circuit

604b-Low voltage line for the Remote Transmitter circuit

605-Voltage for High Line 8 to 1 Multiplexer

605a-Voltage for Low Line 8 to 1 Multiplexer

606- Low voltage terminal of the switch

607- High voltage terminal of the switch

608-Voltage for EACS Switch

609-EACS Switch

610- Gate of EACS switch

611- High Line 8 to 1 Multiplexer

612- Low Line 8 to 1 Multiplexer

Reference Numerals

Figure 7: Flip-up Watch Remote Drawing

701- Exterior Digital Clock

702- Interior Display Screen

703- Interior Display Screen

704- Keypad

705-~~Entire Flip-up component~~ Hinged Body

706-Base

707-Mode Button

708-Select Button

727 - Hinge

Reference Numerals

Figure 8: Flip-up Watch Remote Drawing

801- Exterior Digital Clock

802- Interior Display Screen

803- Interior Display Screen

804- Keypad

805-~~Entire Flip-up component~~ Hinged Body

806-Base

807-Mode Button

808-Select Button

809- Light

810-~~Select~~ Hinged Body Open Button

Reference Numerals

Figure 9: Basic Watch Remote Drawing

900-display screen

901-light

902- disarm/unlock

903- panic

904- remote start

905- arm/lock

906-base

907- mode

Reference Numerals

Figure 10: ~~Button~~ Keypad Description of Watch Remote

~~1001-outside digital clock~~

~~1002-display screen~~

~~1003-display screen~~

~~1004-keypad (touch buttons)~~

~~1005-entire flip up component~~

~~1006-base (where battery and other internal components are stored)~~

~~1007-side button (mode)~~

~~1008-side button (open~~

~~1009-side button (light)~~

~~1010-side button (select)~~

1011-remote start

1012-arm/lock doors

1013-disarm/unlock doors

1014-panic

1015-numeric 7/letters Q,R

1016-numeric 8/letters S,T

1017- numeric 9/letters U,V,W

1018- numeric 0/letters X,Y,Z

1019- numeric 4/letters I,J

1020- numeric 5/letters K,L

1021- numeric 6/letters M,N

1022- up scroll/letters O,P

1023- numeric 1/letters A,B

1024- numeric 2/letters C,D

1025- numeric 3/letters E,F

1026- down scroll/letters G,H

~~1027- hinge~~

Description –Main Embodiment (narrative of the structure)

Figure 7 shows the side view of the remote watch. The digital clock **701** located on the outside surface of the ~~flip-up component~~ hinged body **705** will display watch information such as the time and date. The interior display screen **702** located on the base **706** of the watch remote will display the time and alternative watch functions (calendar, schedule, etc.). The interior display screen **702** is displayed when the ~~flip-up component~~ hinged body **705** is opened. The display screen **703** located on the inside of the ~~flip-up component~~ hinged body **705** will display feedback of various car functions. For example, if the armed button is pressed, the display screen **703** will display feedback information for the car alarm functions related to arming the vehicle.

Figure 8 shows the same version of the watch from a frontal/top view displaying the entire ~~flip up component~~ hinged body **805**, the hinge **827** whereby the said ~~flip up component~~ hinged body **805** will be able to be attached to the base **806** and flip upward showing the interior components. The entire ~~flip up component~~ hinged body **805** that contains an outside digital clock display **801,** an interior display screen **803,** and base **806.** The said ~~flip up component~~ hinged body **805** is preferably made of stainless steel and has a thickness less than that of the base **806.** The outside display clock **801** will preferably be a liquid crystal display screen, where the width of the screen will be the same as the interior display screen **802.** The length of the said outside display clock will be less than half of the interior display screen or at least 1.0 cm long. The interior display screen **802**, a display screen **803**, and a keypad **804** are visible when the said ~~flip up component~~ hinged body **805** is opened by pressing the hinged body open button **810**. Both the interior display screen **802** and the other display screen **803** will also be liquid crystal display screens. Display screen ~~803~~ 802 will show the functions of the car alarm (ex. If the alarm is armed or disarmed, remote started, sunroof open/closed, etc.). ~~A~~ Said display screen ~~802~~ **803** is shown directly below the said display screen ~~803~~ **802** as seen in figures 7 and 8. Display screen

~~802~~ **803** will display the time, date, and calendar that are accessed through the use of the mode button **807**. The light button **809** will be used to activate the background light for all display screens. With the select button **808**, the user will have the ability to activate the menu options.

Operation –Main Embodiment (How it works)

Explanation of Circuits

Figures 3, 4, 5, & 6

This design assumes the main source of power is a 3 V DC supply for a watch circuit and for a remote control transmitter circuit. It is assumed that eight single-post-single-single-throw switches are available, each connected to some switched circuit and each with a low voltage terminal and a high voltage terminal. The circuit works for a low voltage terminal post that is approximately at ground potential and for small AC signals at open-circuited switch terminals. The L^{th} pair of switch lines are connected to an impedance (Z_{SDL}) that models the L^{th} switched circuit, $L \varepsilon\{1, 2, \ldots, 8\}$.

Figure 3

By assumption, eight switches are available from two systems: the watch and the remote control transmitter **300**. The switching circuitry **301** enables the controlling and operating means of the watch and security system functions by the selection of any one of the eight pairs of lines **304** across which a switch can be placed. This selection occurs by placing a three-bit binary address on the switch select lines **304**. In addition, the switching circuitry **301** develops an electronic switch that opens and closes, placing it across the selected pair of lines (the L^{th} lines).

Figure 4

Normally a mechanical SPST switch with two terminals is connected to a "switched circuit **400**." This switch is removed, replaced by an electronic switch **403**. The electronic switch **403** consists primarily of an enhanced metal oxide semiconductor field effect transistor (EnMOSFET). The EnMOSFET switch consists of a source **403a**, gate **403b**, and drain **403c**. The EnMOSFET AC Switch (EACS) circuit indirectly connects the high **402** and low **401** terminals of the switch for small AC signals. The 2kΩ resistor **404** on the drain provides on-state protection, and determines a DC quiescent point.

Figure 5

A & B

Figure 5a shows the EnMOSFET switch connected to the AC output **500a**. When the gate voltage of the EnMOSFET switch is high **501a** (~3 V), turning the transistor on, an AC ground exists on the drain **505a** terminal of the FET placing the drain **505a** and source **506a** at approximately the same potential. Figure 5b is the closed circuit condition of the electron switch. When the gate voltage is low **502b**, AC current flow discontinues resulting in an open circuit or the open electron switch **503b** condition. The 2kΩ resistor **504b** on the drain provides on-state protection, and determines a DC quiescent point.

Figure 6

This design assumes the main source of power is a 3 V DC **600** supply for a watch circuit **602** and for a remote control transmitter **601** circuit. It is assumed that eight single-post-single-single-throw switches are available, each connected to some switched circuit and each with a low voltage terminal (**603b** & **604b**) and a high voltage terminal (**603a** & **604a**). The switching circuitry primarily consists of the EACS **609** and two multiplexers. Two 8-to-1 multiplexers operate in parallel sharing the same address lines (switch select lines). One multiplexer **611** selects the high potential terminal of the L^{th} switch and the other **612** selects the low potential terminal. The EACS **609** produces the opening and closing actions of the switch.

Operation

Figure 2

Watch Transmitter

The remote watch car alarm system includes the watch (see Fig.2) and an onboard control module (see Fig 1). The watch that is worn by the vehicle owner/operator consists of an LCD screen **202**, operational keypad **201**, code generator **210**, mode controller **209**, memory **203**, timer **208**, transceiver **211**, and buzzer **206**. The onboard module (see fig 1) will consist of a controller processing unit **100** or a microprocessor program controller, timer **105**, memory unit **104**, transceiver **108**, proximity detector **107**, sensor zone circuitry **106**, input interface **109**, and an output interface **110**.

Referring to the schematic block diagram of FIG. 2, the remote watch includes a liquid crystal display **202** for displaying such information as the time, date, Mode State of the watch, and preset alarm times. The said watch will also include an operational keypad **201** for entering a variety of functions including, information for the date and time or car security functions such as arm/disarm, remote start and etc.

The control section **207** of the watch has a mode controller **209**, code generator **210**, and an alarm timer **208**. The mode controller **209** sets the mode in which the watch will operate. The code generator **210** inputs code data **212** to the circuitry of the transceiver **211**. The timer **208** will cause the mode controller **209** to switch back to the watch setting (mode) after a car security button is pressed on the keypad **201**. The timer **208** will then alert the user when an alarm time is activated via the buzzer **206**. As would be readily understood by those skilled in the art.

The digital remote watch further includes memory (**203**) and a buzzer (**206**). The memory **203** will be used for storage of data such as the set alarm generating time (wake-up alarm), the mode being currently affected, the month, day, year data, and the time (hour/minute). The buzzer **206** will chirp with the corresponding car security functions (ex. arm/disarm) as well as with (wake-up) alarm settings.

Operation

Figure 1

Onboard Control Module

Referring to Fig. 1, the operational signal **103** from the digital watch remote **102** is received by the external antenna **101** then the transceiver **108** receives the amplified signal from the transmitting/receiving antenna **101** and feeds the received operational signal to the proximity detector **107**. The proximity detector **107** verifies the interrogating signal, detects the level of received operation

signal, generates a proximity signal when the signal is above a predetermined level, the detector then feeds the proximity signal to the controller processing unit **100**.

The controller-processing unit **100** generates a series of control signals or pulses as its outputs. These include activities such as locking the doors and arming the system. For example, arming the system causes a flash of the automobile parking lights **125**, a single chirp from the siren **126**, and causing the flashing the interior LED **124** status indicator to activate. Additionally, arming the system causes the starter **118** to be cut and if the interior dome light **123** is on, to turn it off, as would be readily understood by those skilled in the art.

The timer component **105** measures a preset time and is set and/or reset under the control of the controller-processing unit **100**. The memory **104** functions as an internal memory for the controller-processing unit **100** or as an auxiliary memory for other components or devices incorporated in the system. Data writing to or reading from the memory is performed under the control of the controller-processing unit **100**. This is readily understood by those skilled in the art.

As illustrated, the input interface **109** is connected to various vehicle inputs including an ignition switch **111**, trunk switch **112**, hood switch **113**, door switches **114**, key in ignition switch, pre-warn sensor, valet switch **115** and zone sensors **106**. The sensor zone circuitry **106** performs the security function of the automobile. When the sensor zone circuitry **106** detects ~~touching~~ tampering, it generates a signal and feeds it directly to the controller-processing unit **100**. As would be readily understood by those skilled in the art, other inputs are also contemplated by the present invention and are described by the term sensor.

The output interface **110** of the controller-processing unit **100** can be connected to a variety of output devices. The outputs may include and not limited to auxiliary relays such as window control **116** or remote start **121**, as would be readily understood by those skilled in the art. Other outputs include a

panic output **117**, starter kill **118**, disarm/arm outputs **119/120**, dome light **123**, parking lamps **125**, siren **126**, alphanumeric character display **122**, and valet/dashboard red or green emitting LED's **124**.

Operation

Figure 9

Basic Design

Figure 9 shows a prototype of the watch from a top view and a side view showcasing buttons for the security system and display screen. The manner of using the watch remote security system is simple, the security system can be armed by pushing the arm button **905** and disarmed by pushing the disarm button **902**. The panic button **903** will cause the alarm to sound when pushed. The mode button **907** will enable a person to change the time/date. The light button **901** will illuminate the display screen(s).

~~Operation~~

~~**Figure 10**~~

~~**3 Display Screens Design**~~

~~Figure 10 shows a version of the watch from a frontal and top view showcasing the entire flip up component **1005**, interior display screen **1003**, interior display screen **1002**, buttons **1007**, **1008**, **1009**, **1010** and keypad **1004** in detail. The manner of using the digital car alarm watch remote begins while the watch is closed. The flip up component **1005** will lie on top of the base **1006**. The base **1006** encompasses the battery, circuit board, wiring, mounting for a keypad **1004,** and docking area for a display screen **1002.** The outside of the digital clock (not shown here but on Figure 7 Reference~~

~~Numeral 1) will be on the outside of the said flip-up component **1005.** Flip-up component **1005** will be attached by a hinge **1027** to base **1006.** When the open button **1008** is pressed, the hinge **1027** will allow the flip-up component **1005** to open and showcase a display screen **1003**. Display screen **1003** will show the functions of the car alarm (ex. If the alarm is armed or disarmed, remote started, sunroof open/closed, etc.). The said display screen is where the regular watch functions such as the time, scheduling, a calendar and memos, can be changed/updated through a menu selection screen. For example, if a user wants to change the time on display screens **1002** and **1001** (see figure 7 & 8), they would do so through the menu selection screen on said display screen **1003**. The user will use the mode button **1007**~~ The user can switch the function of the watch using the directional buttons **1022 & 1026** to navigate through the menu options, and the select button **1010** or the tri-functional button **1018** will be used to select a particular menu option. ~~A display screen **1002** is shown directly below the said display screen **1003** as seen in figures 7 and 8. Display screen **1002** will display the time, date, and calendar that are accessed through the use of the mode button **1007**.~~

~~Below said display screen **1002** is a keypad **1004** that will allow the user to control the functions of the car security system. Through the use of keypad **1004** the functions of the car security system can be activated. The following will describe buttons dedicated to functions relating to the car security system.~~ The remote start button **1011** will start the user's vehicle; arm/lock button **1012** will arm the security system and lock the user's vehicle. The disarm/unlock button **1013** will disarm the car security system and unlock the vehicle; the panic button **1014** will cause the car security alarm to activate when depressed. Reference numerals **1015-1021** are alpha/numeric buttons which are used for inputting numbers/letters for the setting of time, date, names, changing the date, telephone numbers, etc. Reference numerals **1022 & 1026** are the alpha/directional buttons, which navigate the user through the digital security watch's menu functions. Button **1018** is a tri-functional button that allows the user to select a menu option, input the number 0, or the letters XYZ.

~~The buttons located on the side of the base **1006** are other functional buttons for the general operation of the watch. The light button **1009**, when depressed will provide backlight for all display screens (Reference numerals **701, 702**, and **703** Figure 7). The mode button **1007** will allow the user to switch from the security functions to the watch functions (time, date, telephone etc.) or vice versa, and the select button **1010** will activate one of the mentioned functions. (ex. once the mode button is touched the display screen **1003** will show "watch functions" and "security functions"; the user will then utilize the up or down scroll buttons **1022** and **1026** to highlight the function and then will utilize the select button **1010** or **1018** to select the function to be entered.)~~

Conclusion, Ramifications, and Scope of Invention

The remote watch security system provides a very reliable, economical device that can be used by persons of almost any age, linking the individual to his/her vehicle at all times, giving feedback on the condition of the vehicle and vibrating or beeping to alarm the individual that their vehicle is being tampered with. While the above description contains many specificities, these should not be construed as limitations on the scope of the invention, but rather as an exemplification of one preferred embodiment thereof. Many other variations are possible that we did not consider important enough to show in drawing and describe in detail in our description. For example, this device can have minor variations in color, size, and materials. Furthermore, the digital watch can have variations in these areas:

- the wrist bands can be synthetic in different colors, or metallic (ex. Titanium)
- the entire watch transmitter can be metallic
- the display screen can light in various colors (ex. Red, green, yellow etc.)
- entire watch remote can be hard plastic with a synthetic band
- the watch transmitter can be made in various shapes and sizes (ex. Round, rectangular, square etc.)

- the ~~flip up component~~ hinged body can have an outer digital display clock or not
- the watch transmitter can have a flip up component or not
- the ~~flip up component~~ hinged body can have an analog watch face with short hand and long hand on the outer part of the ~~flip up component~~ hinged body and a display screen on the interior part of the ~~flip up component~~ hinged body
- the keypad can be arranged in many ways and the buttons can be in various shapes, sizes, and made from different materials (rubber, plastic, metal alloy, etc.)
- the keypad can be used for various functions related to the watch and the security system
- the outer buttons on the sides of the watch transmitter can be in different shapes, sizes and colors and can be used for various functions
- the range in which the watch remote can control the security system can be changed (ex. extended for longer range)
- the watch transmitter can incorporate different trademarks and logos of designer watch, clothing, and automotive manufacturers
- the watch transmitter can have automatic sliding components
- the watch transmitter can have voice commands (ex. through the use of voice command the security system can be armed/locked, disarmed/unlocked, remotely started etc.)
- the display screen can be in various sizes
- the program of the watch can have a menu selection screen with various options to cycle through
- the digital watch remote will be able to operate other power functions for different vehicles (ex. Power rear gate and power side sliding doors for mini-vans).
- The battery can be a rechargeable Ni-Cd battery that allow for extended battery life and lower maintenance cost for the user.
- Watch transmitter can be solar powered

Abstract

A remote watch (Figures 7) design for a car security system, comprising of a display screen and base **706** with keypad **704**. A user of the remote watch will not only be able to keep track of the time but also will be able to arm/lock, disarm/unlock and remotely start their vehicle by pushing specific buttons on the watch. It is common for people to lose or misplace their keys along with the keyless remote that is attached to the keys. Since the watch is placed on the users wrist, the user never has to worry about damage due to dropping it on a hard surface, in liquids (ex. water), or even losing their keyless remote as you would by having a keyless remote attached to keys or a key chain. If the user ever loses their keys, the remote watch will now allow the user to still have access to their vehicle without their keys, thus giving the user the freedom to store an extra set of keys in their vehicle in case they lose the original ones.

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These particular devices look like toys. They both still hold true to the traditional keyless entry remotes that can be attached to a key chain and possibly damaged by those people who toss their keys around and lost by those who are careless. It is also not waterproof as our invention can be and will not have the style along with convenience, as our invention will.

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iv. The watch gives you feedback by transmitting the condition of the vehicle.
v. This invention is located in the most convenient and easy to access area, the user's wrist. Having the device on the wrist will allow hassle-free convenient usage. Other car security devices have to be pulled out of a pocket, bag, or another area.
vi. The watch displays the time.
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ix. If you loose your keys then a person can feel safe about leaving a spare key in the car because they will still be able to unlock and disarm the security system from the remote watch which is worn on your wrist and not attached to the keys which can be lost.

Drawings & Figures

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Figure 4: EnMOSFET Switch

400-Switched Circuit

401-Low voltage terminal of the switch

402-High voltage terminal of the switch

403-n-channel enhancement MOSFET

403a-Source of enhancement MOSFET switch

403b-Gate of enhancement MOSFET switch

403c-Drain of enhancement MOSFET switch

404-2kΩ Resister

405-Power Source

Reference Numerals

Figure 5: Small AC Equivalent Output Circuit

500a-What the AC output circuit is connected to

500b- What the AC output circuit is connected to

501a-High voltage terminal of switch (on)

501b- High voltage terminal of switch (off)

502a-Low voltage terminal of switch (on)

502b- Low voltage terminal of switch (off)

503a-RDS on – On position resister

504a-2kΩ Resister

504b-2kΩ Resister

505a- Drain of enhancement MOSFET switch (on)

505b- Drain of enhancement MOSFET switch (off)

506a-Source of enhancement MOSFET switch (on)

506b- Source of enhancement MOSFET switch (off)

503b-RDS off – Off position resister

Reference Numerals

Figure 6: EACS Controlled Switch System

600-3V Battery voltage

601-Remote transmitter circuit

602-Watch Circuit

603a-High voltage lines for the watch circuit

603b-Low voltage lines for the watch circuit

604a-High voltage lines for the Remoter Transmitter circuit

604b-Low voltage line for the Remote Transmitter circuit

605-Voltage for High Line 8 to 1 Multiplexer

605a-Voltage for Low Line 8 to 1 Multiplexer

606- Low voltage terminal of the switch

607- High voltage terminal of the switch

608-Voltage for EACS Switch

609-EACS Switch

610- Gate of EACS switch

611- High Line 8 to 1 Multiplexer

612- Low Line 8 to 1 Multiplexer

Reference Numerals

Figure 7: Flip-up Watch Remote Drawing

701- Exterior Digital Clock

702- Interior Display Screen

703- Interior Display Screen

704- Keypad

705-Hinged Body

706-Base

707-Mode Button

708-Select Button

727 – Hinge

Reference Numerals

Figure 8: Flip-up Watch Remote Drawing

801- Exterior Digital Clock

802- Interior Display Screen

803- Interior Display Screen

804- Keypad

805-Hinged Body

806-Base

807-Mode Button

808-Select Button

809- Light

810- Hinged Body Open Button

Reference Numerals

Figure 9: Basic Watch Remote Drawing

900-display screen
901-light
902- disarm/unlock
903- panic
904- remote start
905- arm/lock
906-base
907- mode

Reference Numerals

Figure 10: Keypad Description of Watch Remote

1011-remote start
1012-arm/lock doors
1013-disarm/unlock doors
1014-panic
1015-numeric 7/letters Q,R
1016-numeric 8/letters S,T
1017- numeric 9/letters U,V,W
1018- numeric 0/letters X,Y,Z
1019- numeric 4/letters I,J
1020- numeric 5/letters K,L
1021- numeric 6/letters M,N
1022- up scroll/letters O,P
1023- numeric 1/letters A,B
1024- numeric 2/letters C,D
1025- numeric 3/letters E,F
1026- down scroll/letters G,H

Description –Main Embodiment (narrative of the structure)

Figure 7 shows the side view of the remote watch. The digital clock **701** located on the outside surface of the hinged body **705** will display watch information such as the time and date. The interior display screen **702** located on the base **706** of the watch remote will display the time and alternative watch functions (calendar, schedule, etc.). The interior display screen **702** is displayed when the hinged body **705** is opened. The display screen **703** located on the inside of the hinged body **705** will display

feedback of various car functions. For example, if the armed button is pressed, the display screen **703** will display feedback information for the car alarm functions related to arming the vehicle.

Figure 8 shows the same version of the watch from a frontal/top view displaying the entire hinged body **805**, the hinge **827** whereby the said hinged body **805** will be able to be attached to the base **806** and flip upward showing the interior components. The entire hinged body **805** that contains an outside digital clock display **801,** an interior display screen **803,** and base **806.** The said hinged body **805** is preferably made of stainless steel and has a thickness less than that of the base **806.** The outside display clock **801** will preferably be a liquid crystal display screen, where the width of the screen will be the same as the interior display screen **802.** The length of the said outside display clock will be less than half of the interior display screen or at least 1.0 cm long. The interior display screen **802**, a display screen **803**, and a keypad **804** are visible when the said hinged body **805** is opened by pressing the hinged body open button **810**. Both the interior display screen **802** and the other display screen **803** will also be liquid crystal display screens. Display screen **802** will show the functions of the car alarm (ex. If the alarm is armed or disarmed, remote started, sunroof open/closed, etc.). Said display screen **803** is shown directly below the said display screen **802** as seen in figures 7 and 8. Display screen **803** will display the time, date, and calendar that are accessed through the use of the mode button **807**. The light button **809** will be used to activate the background light for all display screens. With the select button **808**, the user will have the ability to activate the menu options.

Operation –Main Embodiment (How it works)

Explanation of Circuits

Figures 3, 4, 5, & 6

This design assumes the main source of power is a 3 V DC supply for a watch circuit and for a remote control transmitter circuit. It is assumed that eight single-post-single-single-throw switches are available, each connected to some switched circuit and each with a low voltage terminal and a high

voltage terminal. The circuit works for a low voltage terminal post that is approximately at ground potential and for small AC signals at open-circuited switch terminals. The L^{th} pair of switch lines are connected to an impedance (Z_{SDL}) that models the L^{th} switched circuit, L $\varepsilon\{1, 2, \ldots, 8\}$.

Figure 3

By assumption, eight switches are available from two systems: the watch and the remote control transmitter **300**. The switching circuitry **301** enables the controlling and operating means of the watch and security system functions by the selection of any one of the eight pairs of lines **304** across which a switch can be placed. This selection occurs by placing a three-bit binary address on the switch select lines **304**. In addition, the switching circuitry **301** develops an electronic switch that opens and closes, placing it across the selected pair of lines (the L^{th} lines).

Figure 4

Normally a mechanical SPST switch with two terminals is connected to a "switched circuit **400**." This switch is removed, replaced by an electronic switch **403**. The electronic switch **403** consists primarily of an enhanced metal oxide semiconductor field effect transistor (EnMOSFET). The EnMOSFET switch consists of a source **403a**, gate **403b**, and drain **403c**. The EnMOSFET AC Switch (EACS) circuit indirectly connects the high **402** and low **401** terminals of the switch for small AC signals. The 2kΩ resistor **404** on the drain provides on-state protection, and determines a DC quiescent point.

Figure 5

A & B

Figure 5a shows the EnMOSFET switch connected to the AC output **500a**. When the gate voltage of the EnMOSFET switch is high **501a** (~3 V), turning the transistor on, an AC ground exists on the drain **505a** terminal of the FET placing the drain **505a** and source **506a** at approximately the same potential. Figure 5b is the closed circuit condition of the electron switch. When the gate voltage is low **502b**, AC current flow discontinues resulting in an open circuit or the open electron switch **503b** condition. The 2kΩ resistor **504b** on the drain provides on-state protection, and determines a DC quiescent point.

Figure 6

This design assumes the main source of power is a 3 V DC **600** supply for a watch circuit **602** and for a remote control transmitter **601** circuit. It is assumed that eight single-post-single-single-throw switches are available, each connected to some switched circuit and each with a low voltage terminal (**603b** & **604b**) and a high voltage terminal (**603a** & **604a**). The switching circuitry primarily consists of the EACS **609** and two multiplexers. Two 8-to-1 multiplexers operate in parallel sharing the same address lines (switch select lines). One multiplexer **611** selects the high potential terminal of the L^{th} switch and the other **612** selects the low potential terminal. The EACS **609** produces the opening and closing actions of the switch.

Operation

Figure 2

Watch Transmitter

The remote watch car alarm system includes the watch (see Fig.2) and an onboard control module (see Fig 1). The watch that is worn by the vehicle owner/operator consists of an LCD screen **202**, operational keypad **201**, code generator **210**, mode controller **209**, memory **203**, timer **208**, transceiver **211**, and buzzer **206**. The onboard module (see fig 1) will consist of a controller processing unit **100** or a microprocessor program controller, timer **105**, memory unit **104**, transceiver **108**, proximity detector **107**, sensor zone circuitry **106**, input interface **109**, and an output interface **110**.

Referring to the schematic block diagram of FIG. 2, the remote watch includes a liquid crystal display **202** for displaying such information as the time, date, Mode State of the watch, and preset alarm times. The said watch will also include an operational keypad **201** for entering a variety of functions including, information for the date and time or car security functions such as arm/disarm, remote start and etc.

The control section **207** of the watch has a mode controller **209**, code generator **210**, and an alarm timer **208**. The mode controller **209** sets the mode in which the watch will operate. The code generator **210** inputs code data **212** to the circuitry of the transceiver **211**. The timer **208** will cause the

mode controller **209** to switch back to the watch setting (mode) after a car security button is pressed on the keypad **201**. The timer **208** will then alert the user when an alarm time is activated via the buzzer **206**. As would be readily understood by those skilled in the art.

The digital remote watch further includes memory (**203**) and a buzzer (**206**). The memory **203** will be used for storage of data such as the set alarm generating time (wake-up alarm), the mode being currently affected, the month, day, year data, and the time (hour/minute). The buzzer **206** will chirp with the corresponding car security functions (ex. arm/disarm) as well as with (wake-up) alarm settings.

Operation

Figure 1

Onboard Control Module

Referring to Fig. 1, the operational signal **103** from the digital watch remote **102** is received by the external antenna **101** then the transceiver **108** receives the amplified signal from the transmitting/receiving antenna **101** and feeds the received operational signal to the proximity detector **107**. The proximity detector **107** verifies the interrogating signal, detects the level of received operation signal, generates a proximity signal when the signal is above a predetermined level, the detector then feeds the proximity signal to the controller processing unit **100**.

The controller-processing unit **100** generates a series of control signals or pulses as its outputs. These include activities such as locking the doors and arming the system. For example, arming the system causes a flash of the automobile parking lights **125**, a single chirp from the siren **126**, and causing the flashing the interior LED **124** status indicator to activate. Additionally, arming the system causes the starter **118** to be cut and if the interior dome light **123** is on, to turn it off, as would be readily understood by those skilled in the art.

The timer component **105** measures a preset time and is set and/or reset under the control of the controller-processing unit **100**. The memory **104** functions as an internal memory for the controller-processing unit **100** or as an auxiliary memory for other components or devices incorporated in the system. Data writing to or reading from the memory is performed under the control of the controller-processing unit **100**. This is readily understood by those skilled in the art.

As illustrated, the input interface **109** is connected to various vehicle inputs including an ignition switch **111**, trunk switch **112**, hood switch **113**, door switches **114**, key in ignition switch, pre-warn sensor, valet switch **115** and zone sensors **106**. The sensor zone circuitry **106** performs the security function of the automobile. When the sensor zone circuitry **106** detects tampering, it generates a signal and feeds it directly to the controller-processing unit **100**. As would be readily understood by those skilled in the art, other inputs are also contemplated by the present invention and are described by the term sensor.

The output interface **110** of the controller-processing unit **100** can be connected to a variety of output devices. The outputs may include and not limited to auxiliary relays such as window control **116** or remote start **121**, as would be readily understood by those skilled in the art. Other outputs include a panic output **117**, starter kill **118**, disarm/arm outputs **119/120**, dome light **123**, parking lamps **125**, siren **126**, alphanumeric character display **122**, and valet/dashboard red or green emitting LED's **124**.

Operation

Figure 9

Basic Design

Figure 9 shows a prototype of the watch from a top view and a side view showcasing buttons for the security system and display screen. The manner of using the watch remote security system is

simple, the security system can be armed by pushing the arm button **905** and disarmed by pushing the disarm button **902**. The panic button **903** will cause the alarm to sound when pushed. The mode button **907** will enable a person to change the time/date. The light button **901** will illuminate the display screen(s).

Operation

Figure 10

The user can switch the function of the watch using the directional buttons **1022 & 1026** to navigate through the menu options, and the select button **1010** or the tri-functional button **1018** will be used to select a particular menu option. -The remote start button **1011** will start the user's vehicle; arm/lock button **1012** will arm the security system and lock the user's vehicle. The disarm/unlock button **1013** will disarm the car security system and unlock the vehicle; the panic button **1014** will cause the car security alarm to activate when depressed.–Reference numerals **1015-1021** are alpha/numeric buttons which are used for inputting numbers/letters for the setting of time, date, names, changing the date, telephone numbers, etc. Reference numerals **1022 & 1026** are the alpha/directional buttons, which navigate the user through the digital security watch's menu functions. Button **1018** is a tri-functional button that allows the user to select a menu option, input the number 0, or the letters XYZ.

Conclusion, Ramifications, and Scope of Invention

The remote watch security system provides a very reliable, economical device that can be used by persons of almost any age, linking the individual to his/her vehicle at all times, giving feedback on the condition of the vehicle and vibrating or beeping to alarm the individual that their vehicle is being tampered with. While the above description contains many specificities, these should not be construed

as limitations on the scope of the invention, but rather as an exemplification of one preferred embodiment thereof. Many other variations are possible that we did not consider important enough to show in drawing and describe in detail in our description. For example, this device can have minor variations in color, size, and materials. Furthermore, the digital watch can have variations in these areas:

- the wrist bands can be synthetic in different colors, or metallic (ex. Titanium)
- the entire watch transmitter can be metallic
- the display screen can light in various colors (ex. Red, green, yellow etc.)
- entire watch remote can be hard plastic with a synthetic band
- the watch transmitter can be made in various shapes and sizes (ex. Round, rectangular, square etc.)
- the hinged body can have an outer digital display clock or not
- the watch transmitter can have a flip up component or not
- the hinged body can have an analog watch face with short hand and long hand on the outer part of the hinged body and a display screen on the interior part of the hinged body
- the keypad can be arranged in many ways and the buttons can be in various shapes, sizes, and made from different materials (rubber, plastic, metal alloy, etc.)
- the keypad can be used for various functions related to the watch and the security system
- the outer buttons on the sides of the watch transmitter can be in different shapes, sizes and colors and can be used for various functions
- the range in which the watch remote can control the security system can be changed (ex. extended for longer range)
- the watch transmitter can incorporate different trademarks and logos of designer watch, clothing, and automotive manufacturers
- the watch transmitter can have automatic sliding components

- the watch transmitter can have voice commands (ex. through the use of voice command the security system can be armed/locked, disarmed/unlocked, remotely started etc.)
- the display screen can be in various sizes
- the program of the watch can have a menu selection screen with various options to cycle through
- the digital watch remote will be able to operate other power functions for different vehicles (ex. Power rear gate and power side sliding doors for mini-vans).

- The battery can be a rechargeable Ni-Cd battery that allow for extended battery life and lower maintenance cost for the user.
- Watch transmitter can be solar powered

Abstract

A remote watch (Figures 7) design for a car security system, comprising of a display screen and base **706** with keypad **704**. A user of the remote watch will not only be able to keep track of the time but also will be able to arm/lock, disarm/unlock and remotely start their vehicle by pushing specific buttons on the watch. It is common for people to lose or misplace their keys along with the keyless remote that is attached to the keys. Since the watch is placed on the users wrist, the user never has to worry about damage due to dropping it on a hard surface, in liquids (ex. water), or even losing their keyless remote as you would by having a keyless remote attached to keys or a key chain. If the user ever loses their keys, the remote watch will now allow the user to still have access to their vehicle without their keys, thus giving the user the freedom to store an extra set of keys in their vehicle in case they lose the original ones.